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ABSTRACT

Driven in part by research findings in early childhood development, the academic, business, and policy communities now recognize that high-quality preschool programs are an important way to help children reach their full potential. Although some current research suggests that teacher preparation at the four-year college degree level is the best way to achieve such quality, recommending such a standard for teachers in early childhood settings has raised considerable debate. This paper reviews research literature on the relationship between teacher preparation and child outcomes in ECE programs, focusing on the central question of whether teachers with at least a BA degree in ECE provide better quality preschool experiences for 3- to 5-year-olds than those with less education. The review was limited to peer-reviewed journal articles and reports, to studies examining education and care programs with classrooms serving 3- to 5-year-olds, and to studies that allowed for exploration of particular features of high-quality programs. The review concentrated on studies with samples including more settings in diverse regulatory environments, and those employing multivariate analyses exploring the relative contribution of teacher education/training to positive program quality and child development. The review notes that although the studies had some limitations in sample, measures, and analytic methods, they underscore the importance of more higher education and specialized training, and identify the role of the bachelor's degree, most often in ECE, in producing teacher behaviors consistent with high-quality programming, which in turn supports better developmental outcomes. The body of research raises several questions requiring further investigation, particularly regarding thresholds of education and training; the content, format, and quality of specialized early childhood training; variations in strategies for teachers with varying characteristics and needs; and the aspects of the adult work environment that scaffold teachers' knowledge, enabling them to engage in effective strategies with children. The review also points out that decisions about qualifications and requirements for preschool and other early childhood teachers will be driven by their feasibility as well as empirical evidence, and that the more diverse a state's preschool system, the more complex it will be to enforce common standards for professional development. (Contains 94 references.) (KB)

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Early Education Quality: Higher Teacher Qualifications for Better Learning Environments - A Review of the Liturature

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2003

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Recognizing the importance of early learning experiences for young children's school readiness and lifelong success, states and communities throughout the country are planning or implementing initiatives to assure greater access to high-quality, publicly supported preschool services. In order to design such efforts, planners need accurate information about the programmatic factors that lead to best practices and best outcomes in early education – particularly in the area of professional preparation for teachers.

Increasingly, the national trend is to raise teacher qualifications, with an emphasis on college degrees in early childhood education (ECE), child development (CD) or a related field. Head Start has raised its standards to require every classroom to have an associate degree-level (AA/AS) teacher by fall 2003, and the pending reauthorization bill sets a new goal of 50 percent of Head Start teachers holding a bachelor's degree (BA/BS) by 2008. The accompanying chart (Barnett, 2003b) indicates where the states have currently set their minimum post-secondary degree standards for teachers in state-financed prekindergarten (pre-K) programs. These range from 24 credit hours in California, a Child Development Associate (CDA) certificate in 11 states, and a BA degree in 20 states and the District of Columbia, to a master's (MA) degree (after five years of employment) in New York. Thus far, however, states have had mixed success in meeting their own standards, particularly in privately operated sectors of state-funded pre-K systems (Bellm, Burton, Whitebook, Broatch & Young, 2002).

Several previous research reviews address the relationship of teacher background and quality (Barnett, 2003a; Bowman, Donovan & Burns, 2001; Howes & Brown, 2000), and have all come to the conclusion that the presence of BA-level teachers with specialized training in early childhood education leads to better outcomes for young children. As we review the research on teacher qualifications and preschool program quality, we must recognize that in most states, recommending a BA in ECE or a similar standard would result in a significant raising of standards for teachers in early childhood settings, and such a suggestion can therefore trigger considerable debate.

In some cases, the underlying cost implications of raising standards drive this debate, and in some communities, concerns about the existing child care workforce's ability to meet a higher standard – and/or issues of linguistic and cultural diversity in the workforce – also prompt questions about raising qualifications. Other concerns include the higher education system's capacity to respond to a demand for more college-educated early childhood teachers, and skepticism about how this long-underpaid field will manage to match higher standards with sufficient teacher compensation (Bellm & Whitebook, 2003).

A great deal appears to be at stake for young children and their families as states and communities grapple with these issues, and the discussion about preschool teacher qualifications is in sharp contrast to trends in K-12 education. The chair of the National Research Council's Committee on Integrating the Science of Early Childhood Development, Dr. Jack Shonkoff of Brandeis University, posed a question to Congress in 2002 about the gap between our current understanding of child development and public policies related to the early education workforce:

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Table 1: Minimum Post-Secondary Degree Requirements For Preschool Teachers, By State[8]

State	Kindergarten	State Financed Pre-K	Child Care[2]
ALABAMA	BA[1]	BA[1]	None
ALASKA	BA	CDA[5]	None
ARIZONA	BA	CDA	None
ARKANSAS	BA	BA[1]	None
CALIFORNIA	BA	40 credits[6]	6 credits[3]
COLORADO	BA	CDA	None
CONNECTICUT	BA[1]	CDA	None
DELAWARE	BA[1]	CDA	CDA
DISTRICT OF COLOMBIA	BA[1]	BA	CDA
FLORIDA	BA	None	None
GEORGIA	BA	AA[1]	None
HAWAII	BA	CDA	CDA
IDAHO	BA	N/A	None
ILLINOIS	BA	BA[1],	CDA or CCP
INDIANA	BA	N/A	None
IOWA	BA[1]	None	None
KANSAS	BA	BA	CDA
KENTUCKY	BA[1]	CDA	None
LOUISIANA	BA[1]	BA[1]	None
MAINE	BA	BA[1]	None
MARYLAND	BA[1]	BA[1]	None
MASSACHUSETTS	BA[1]	3 credits[4]	3 credits[4]
MICHIGAN	BA	AA	None
MINNESOTA	BA	CDA	CDA
MISSISSIPPI	BA	N/A	None
MISSOURI	BA[1]	CDA	None
MONTANA	BA	N/A	None
NEBRASKA	BA	BA[1]	None
NEVADA	BA[1]	BA[1]	None
NEW HAMPSHIRE	BA	CDA[5]	12 credits[7]
NEW JERSEY	BA	BA[1]	CDA
NEW MEXICO	BA	None	None
NEW YORK	BA	BA	None
NORTH CAROLINA	BA[1]	AA[1]	None
NORTH DAKOTA	BA	N/A	None
OHIO	BA[1]	AA[1]	None
OKLAHOMA	BA	BA[1]	None
OREGON	BA	CDA	None
PENNSYLVANIA	BA	BA	None
RHODE ISLAND	BA[1]	BA[1]	BA[1]
SOUTH CAROLINA	BA	BA[1]	None
SOUTH DAKOTA	BA	N/A	None
TENNESSEE	BA	BA[1]	None
TEXAS	BA	BA[1]	None
UTAH	BA[1]	N/A	None
VERMONT	BA	BA[1]	12 credits[4]
VIRGINIA	BA[1]	CDA	None
WASHINGTON	BA	AA[1]	None
WEST VIRGINIA	BA	BA	None
WISCONSIN	BA[1]	BA[1]	None
WYOMING	BA	N/A	None

AA – Associates Degree; BA – Bachelor's Degree; CDA – Child Development Associate Credential; Pre-K – Prekindergarten; CCP – Certified Childcare Professional. N/A – state does not provide finances for pre-k; None – no post-secondary degree requirements. 1 – with courses or certification in early childhood. 2 – many states require professional training or ongoing development. 3 – 2 year vocational child care course or 6 credits in early childhood education. 4 – in topics related to early childhood education or child development. 5 – Head Start requirements used because all state pre-k funds supplement Head Start program. 6 – 24 credits in early childhood education and 16 credits more in general education. 7 – in early childhood education, 6 of which may be non-credit courses. 8 – update June, 2003.

Source: Barnett, W. S. (2003b). Better teachers, better preschools: Student achievement linked to teacher qualifications. *NIEER Policy Facts.*

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> How can the recently enacted No Child Left Behind Act emphasize the need for stronger performance standards and financial incentives to attract bright and highly motivated teachers, while we simultaneously tolerate large percentages of inadequately trained and poorly compensated providers of early child care and education who have an important influence on the foundations of school readiness? (Testimony to the U.S. Senate Committee on Health, Education, Labor and Pensions, February 12, 2002, p.3.)

This paper will review what the scientific research literature tells us about the relationship between teacher preparation and child outcomes in early childhood education. This review covers familiar ground for those who have read previous assessments of this literature, but focuses on the remaining unanswered questions that emerge from this body of knowledge, and attempts to identify questions for future research, the answers to which will increase the precision with which we can predict optimal outcomes for preschoolers.

The central question we pose here is whether teachers with a BA degree in early childhood education (or higher) provide better-quality preschool experiences that lead to better outcomes for three- to five-year-olds. There are a number of limitations to the research, however; relatively few studies have dealt directly with this question or posed it exactly this way, and some have dealt more generally with the issue of college-level education for early childhood teachers. Nevertheless, our review of the literature indicates a reasonably strong basis for answering our central question about specialized BA-level preparation.

We do not intend to imply in our central question, however, that *every* teacher in a given early education program would have a BA degree; rather, a standard might be set at one BA-level teacher per classroom, or for a certain number of children (e.g., 20), with this teacher working with one or more assistant teachers. While there has been less discussion thus far of qualifications for assistant teachers, there has been some effort to set standards at the associate (AA) degree level.

Methods

We restricted our literature review to articles published in peer-reviewed journals and reports issued by agencies that subject their reports to peer advising. Most of the studies reviewed here have been published in journals, with a few released as freestanding reports. For some of the large-scale studies, such as the Cost, Quality and Child Outcomes Study, the National Child Care Staffing Study, the Florida Quality Improvement Study, and the Then and Now Study, both peer-reviewed articles and final reports were consulted.

Our initial scan of articles included those that focused on programs in home and center settings serving all ages of children prior to elementary school. Because our immediate concern revolves around the appropriate staffing of publicly financed preschool programs for three- and four-year-olds, we restricted our review to studies that could best address that issue. Thus, we initially narrowed this review to studies that examined programs with classrooms serving three- to five-year-olds, either exclusively or within a larger multi-age program, and that allowed for exploration of the particular features of high-quality programs for the later preschool years. Consequently, studies focused exclusively on teacher background and infant/toddler development

are not discussed in detail in this review (Burchinal, Roberts, Nabors & Bryant, 1996; Burchinal, Roberts, Riggins, Zeisel, Neebe & Bryant, 2000; NICHD, 1996).

We also limited this review to center-based programs, although a number of studies explore the role of family child care provider training and education as it relates to child care quality and child outcomes (Clarke-Stewart, Vandell, Burchinal, O'Brien, & McCartney, 2002; DeBord & Sawyers, 1996; Kontos & Riessen, 1993, Kontos, Howes & Galinksy, 1996). These, too, deserve exploration, particularly as some states move toward establishing publicly-supported preschool programs in home-based settings (Bellm & Whitebook, 2003). It is beyond the scope of this review to attempt a comparison of the literature for both center-based and home-based services, given the diversity across these sectors in terms of regulation, program structure and size, age groups of children served, and provider training, education and motivation.

Having decided to focus on studies related to center-based care for three- and four-year-olds, we next categorized the studies according to research design. Some studies examine only teacher behaviors or overall program quality, and do not include child outcomes; conversely, studies looking at child outcomes may include no specific information about teacher behavior. Thus, we divided studies from our initial scan into two categories: observational studies of program quality (with and without child outcome data) and studies that explored issues of teacher preparation but did not include direct observations of teacher behavior. The review focuses primarily on the observational studies.

Another distinction among the observational studies involves how they collect and analyze teacher background data. Many studies employ linear measures of education and training, either in designing variables or in conducting analyses. They look at training and education as continuous variables, and address only whether more education or training makes a difference, but do not explore the particular role of the BA or of higher degrees in contrast to other levels of education. They may find, for example, that more education and/or training is better than less, but do not establish clear cut-off points (e.g., that an AA degree is less effective than a BA). Further, many studies confound formal education and other child-related training. In part, this is because many in the field who have a BA, for example, have also completed high levels of other training in early childhood education, and this training, when analyzed as a separate variable from college education, may in fact reflect differences in education as well. Some studies also lack specificity regarding what constitutes child-related training; while some include only college-level training, others include informal workshops or high school and vocational school training. Finally, the content and amount of training is often left unspecified. This issue will be addressed in the discussion.

Thus, we further categorized the observational studies into two groups: those that specially weigh in on the question of the role of the bachelor's degree, and those that more generally examine the question of teacher education and training.

In selecting studies for consideration in this review, we also examined the size and complexity of their samples and their analytic rigor. Some studies have small, insufficiently diverse samples with respect to locale or background characteristics of the subjects, which makes it difficult to generalize findings. Such studies may include so few teachers, for example, that is difficult to look at subgroup differences, or there may be little variation among subjects with respect to ethnicity or professional background. In such cases, it is impossible to determine the influence of caregiver socioeconomic status on levels of education. Further, many studies focus on samples selected from

one locale, and thus the results are not necessarily applicable to states with different demographic or regulatory features.

Some studies over-represent certain subgroups (e.g., nonprofit child care centers or low-income families), which also limits the ability to generalize results. Some studies look at relationships among teacher characteristics and behaviors or child outcomes, but do not use multivariate statistics to understand predictors or effect sizes of various variables. In a few studies, observers were not completely blind to who had participated in various educational or training programs. To the extent possible, we concentrate on those with samples that include more settings in diverse regulatory environments, and those employing multivariate analyses that explore the relative contribution of teacher education/training to positive program quality and child development.

There are few experimental designs or longitudinal studies in this literature. It is important to note that the studies reviewed here rely on the natural variation in teacher background that occurs in early care and education programs, and that the samples were drawn to capture the variation of programs in a particular community rather than to test various program designs. Some studies do not include information about pre-existing motivational or other differences among subjects, such as sufficient detail about how program structure, work environment or background climate (i.e., the educational and training background of one's co-workers) impact teacher behavior and child outcomes. None of the studies look at the interactions among formal education, child-related training, and the linguistic and cultural match between young children and their teachers.

Also, this review encompasses early care and education programs broadly defined, rather than looking only at publicly-funded preschool programs and variations among them based on teacher background and other features. We therefore cannot determine whether there are specific features of such programs, such as length of day or curriculum content, that may interact with teacher background so as to impact program quality and child outcomes differently than in other types of early care and education services. In many ways, state-funded preschool shares as many characteristics with early elementary school as it does with child care in terms of structure and goals, and may require different lines of investigation to answer questions around appropriate teacher preparation (Barnett, 2003a).

Observations of Teacher Behavior and Program Quality: The Contribution of Education and Training

More is better

Initiated by the federal government in the 1970s, the National Day Care Study (NDCS) (Ruopp, Travers, Glantz & Coelen, 1979) sought to guide the construction of national child care standards by identifying the key provisions of child care quality in center-based, full-day programs that best predict good outcomes for children, and the costs associated with them. The findings earmarked specialized child-related training, along with group size, as the most potent regulatable predictors of child care quality. Among the 3,167 child care centers in seven states that were contacted by phone for the study, 70 received onsite visits.

The study found that in classrooms whose lead teachers had child-related education, teachers interacted with children more, and children showed more cooperation and greater task persistence.

When preschoolers attended centers with a higher proportion of trained caregivers, they exhibited greater cognitive test score gains than those cared for by less-trained teachers. These general findings, commonly interpreted as "some training is better than none, and more child-related education is better than less," advanced the discussion of the importance of specialized preparation for child care quality at the time, but did not address questions related to college degrees (only information about years of education were collected about staff) or the level and intensity of effective training (only whether staff had taken courses, seminars or in-service training programs related to child care in the last year).

An early study by Berk (1985) is often cited as evidence that overall education is related to positive teacher behaviors, although its conclusions are based on a small, homogeneous sample (37 teachers, all Caucasian, in 12 centers in one Midwestern city, caring mainly for middle-class three- to five-year-olds). Still, the Berk study contributed to the understanding of how the behavior of a particular group of teachers is influenced by more formal education. Unfortunately, it distinguishes only between staff with two or more years of college education,[2] and those with only a high school diploma. Using the Prescott, Hone and Kritchevsky (1972) observational system, teachers with at least two years of college were found to engage in more responsive encouragement of children, and teacher behaviors involving development of verbal skills were almost three times more frequent among the college-educated teachers than among those with high school only. While none of the "high-school-only" teachers had received child-related training, the college group was divided between those with child-related preparation and those with none. No differences in behaviors were found in this study based on specialized early childhood education.

In a small observational study of 24 centers from eight counties ... ...e state, Dunn (1993) found a strong relationship between the number of years of education and teacher behavior, although no distinctions were made among levels of education beyond high school. Program quality was measured with the Early Childhood Environment Rating Scale (ECERS) (Harms & Clifford, 1980),[3] and through audiotaped and coded observations of lead teachers interacting with children. Slightly more than one-half of the teachers had completed some college education, most of them with a child-related major. Higher ECERS scores were highly correlated with more education and fewer years of experience. Because teachers with higher levels of education were more likely to have formal or informal training specifically related to children, and were also more likely to have college-level work in a child-related area, it is not possible to tease apart the relative roles of formal

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[2] All but two of the 29 teachers in the college cohort had completed a BA degree.

[3] The Early Childhood Environment Rating Scale (ECERS) provides information about appropriate caregiving and activities that occur within a particular preschool classroom. The ECERS comprehensively assesses the day-to-day quality of care. The 37-item scale is organized under seven categories: Personal care routines; furnishings and displays for children; language-reasoning experience; fine and gross motor activities; creative activities; social development; and adult needs. Individual items are rated from a low of 1 to a high of 7. A rating of 3 on these scales indicates "minimally acceptable quality," while 5 indicates "good" quality and 7 indicates "excellent quality." The ECERS authors also developed similar measures for infant/toddler and home-based settings, the Infant Toddler Environment Rating Scale (ITERS) and the Family Day Care Environment Rating Scale (FDCRS). A revised ECERS scale, the ECERS-R (Harms, Clifford & Cryer, 1998), addressing certain concerns and omissions noted by researchers and practitioners, is now used in lieu of the original ECERS. A forthcoming article (Sakai, Whitebook, Wishard & Howes, in press), based on observations of the same classrooms using both measures, concludes that the two measures provide comparable measures of quality. The ECERS-R made some modifications in the subscales, but uses the same scoring system. Studies employing different versions of the ECERS can therefore be compared with confidence.

education *per se* and specifically child-related training. The study also explored the impact of teacher background on child outcomes, using teacher self-reports. Teachers were also asked to rate a randomly selected boy and girl in their classroom, ranging in age from 30 to 60 months, on selected characteristics of social and cognitive development and play. Specialized training at the college level was a positive predictor of children's cognitive development, based on the intellectual subscale of the Classroom Behavior Inventory (Schafer et al., 1987), along with higher ECERS scores and fewer years of experience in the field. When family and center selection effects were controlled, however, the findings were restricted only to children of high socioeconomic status, since they were the only children whose teachers had a child-related major.

Honig and Hirallal (1998) looked at the behaviors of 81 teachers working with three- to five-year-old children in 24 centers in one mid-sized urban community. Approximately two-thirds of the teachers were Caucasian and slightly more than one-quarter were African American. Teachers were categorized as low or high in education, experience and training, based on the following distinctions: high school through an AA degree (low), vs. a BA degree or higher (high); one to four training courses (low), vs. five or more courses (high); and one to three years of experience (low), vs. four or more years (high). Teachers were observed using the ABC Scale (Adult Behaviors in Caregiving) (Honig & Lally, 1973), which permitted examination of clusters of positive and negative behaviors. Stepwise hierarchical regression was used to determine the proportion of variance that each of the independent variables contributed to each of the domains of teacher behavior. With respect to teacher facilitation of language, social, and emotional development, early childhood education/child development training accounted for most of the variance in predicting teacher behavior, with education making a smaller but significant contribution. With respect to concept development, only ECE/CD training contributed, while formal education was the only variable to significantly account for the variance leading to negative socio-emotional inputs. When all subscales were combined, ECE training accounted for 62 percent of the variance in teacher scores, and formal education increased the variance by 10 percent. Neither years of experience nor stability in one's child care position increased teacher enrichments of children's learning or socio-emotional development in any way, and a high degree of formal education did not ensure positive teacher support for young children if training and experience were low. While this study attempted to tease apart the differential contributions of education, training and experience to teacher behavior, the lack of specificity around early childhood education courses, and whether or not they were delivered at the college level, makes it difficult to draw conclusions from the findings. If those courses were part of an integrated college program, or were delivered at the college level, then the categories of education and training, as defined, are overlapping. Nonetheless, the study advanced the discussion by suggesting the role of specialized training in child development in assessing how formal education impacts teacher behavior, and added to the evidence that experience working with young children, absent education and training, does not predict appropriate caregiving with young children (Helburn, 1995; Ruopp et al., 1979; Whitebook, Howes & Phillips, 1990).

A more recent investigation of early education programs in Massachusetts by Marshall and colleagues (2001) examined quality in 90 full-day, year-round, center-based classrooms serving children 2.9 to 5 years of age, randomly selected to proportionately represent the types of care in the state. The revised version of the Early Childhood Environment Rating Scale (ECERS-R) (Harms, Clifford & Cryer, 1998) was used to assess classroom quality, and information about program features, including teacher background, was gathered through interviews. More than one-half of the classrooms in the sample did not meet the benchmark of good care as defined by the ECERS-R. Low- and moderate-income families were less likely to have access to quality preschool care and

education. Only 10 percent of classroom staff at centers serving predominantly low-income families had a two-year college degree or more, compared to 28 percent at centers serving low- to moderate-income families, and 62 percent at centers serving moderate- to high-income families. As with the Dunn and Berk studies, better program quality was associated with better-educated teachers, but because distinctions were made only between those with AA degrees or higher and those with less than an AA degree, it is not possible to determine the particular contribution of the BA degree over and above a two-year degree.

The contribution of the BA degree and specialized early childhood training in center-based care

Eight studies specifically explore the relative contributions of a bachelor's degree and specialized early childhood training to teacher behavior and program quality, and among them are the large-scale investigations of center-based early education conducted over the last 15 years.[4] These are listed below in chronological order, along with the particular citations used for this review:

- Bermuda College Training Program Study (Arnett, 1989)
- National Child Care Staffing Study (Howes, Phillips & Whitebook, 1992; Whitebook et al., 1990)
- Cost, Quality and Child Outcomes Study (Blau, 2000; Helburn, 1995; Howes, 1995; Howes, 1997; Phillipsen, Burchinal, Howes & Cryer, 1997)
- Florida Quality Improvement Study (Howes, 1997; Howes et al., 1998)
- Three-State Study (Massachusetts, Georgia and Virginia) (Phillips, Mekos, Scarr, McCartney & Abbott-Shim, 2000; Scarr, Eisenberg & Deater-Deckard, 1994)
- Then and Now: Changes in Child Care Staffing (Whitebook, Sakai, Gerber & Howes, 2001; Whitebook & Sakai, in press)
- Head Start FACES Study (Zill et al., 2001)
- New Jersey studies (Barnett, Tarr, Lamy & Frede, 1999, 2001).

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[4]One major investigation not included here, because it focuses on all types of child care, including home-based care, is the longitudinal NICHD Early Child Care Research Network Study. This study examines influences on child development over time by periodically assessing child outcomes; and family and child care characteristics, of 800 children from birth to 54 months. In a 2002 report, the effects of teacher education (across all types of child care) on child care quality, and the effects of child care quality on child outcomes, were tested using structural equation modeling. Researchers found that teachers' educational attainment predicted teacher behavior, which in turn predicted children's social and cognitive outcomes, but these effects were mediated by maternal education and parenting behavior, as well as family economic circumstances, and were less robust than maternal and family influences. Forthcoming papers on these data may provide additional information about the influence of teacher education and behavior.

Although these studies have a variety of strengths and weaknesses, they include those with the largest and most diverse samples and those employing the most rigorous analyses. Taken as a group, these studies strongly suggest the important contribution not simply of more education, but of a bachelor's degree and specialized early childhood training at the college level, in securing high-quality center-based preschool programs.

Along with Berk (1985), Arnett (1989) advanced the discussion of the importance of a BA degree and college-level training in early childhood education in securing child care quality. The study is based on a relatively small but diverse sample of 50 teachers, in 22 of the 23 centers in Bermuda serving preschool-age children. Some of the teachers had no prior early childhood training; some had taken two courses at the Bermuda College Training Programs, some had taken four such courses, and the remainder had earned a four-year degree in Early Childhood Education. Teachers were observed for two 45-minute periods on two days, by two different observers who were blind to teacher education level. Observers used the Caregiver Interaction Scale newly developed by Arnett (1989),[5] which is also employed in several of the later studies described in this review. Child rearing attitudes were measured using the Prenatal Modernity Scale (Schaeffer & Edgerton, 1981). Teachers with a four-year ECE degree were less authoritarian, and were rated higher in positive interaction and lower on punitiveness and detachment, than all other teachers in the sample. Those with two or four years of Bermuda College Training were less authoritarian in their child rearing attitudes than caregivers with no training, and were rated higher on positive interaction and lower on detachment than those with no training. Thus, although teachers with a BA in early childhood education were found to be the most skilled in working with young children, the findings also suggest that college-level training influences teacher behavior without completion of a degree, although not to the same level of skill. Because the analyses did not address preexisting motivational or other differences among the various groups of teachers, it is difficult to tease apart the particular impact of training. The study did include evidence suggesting that the first year of training, focused on child development and communication, vs. the second year, focused on curriculum activities, accounted for differences in behaviors and attitudes between those with some training and those with none. This suggests that along with formal education, the *content* of training warrants further investigation.

The National Child Care Staffing Study (NCCSS) (Howes, Phillips & Whitebook, 1992; Whitebook et al., 1990) examined the quality of care in 227 child care centers, randomly selected from five diverse U.S. metropolitan areas. Observations using the ECERS, ITERS and Caregiver Interaction Scale were conducted in infant, toddler and preschool classrooms in each center. Background information on teacher education and training was collected from 865 teachers and 444 assistant teachers. Best known for establishing the link between teaching staff wages, staff stability, and program quality, the NCCSS also explored the influence of teacher background on classroom quality and child outcomes. Predictions of teacher behavior based on teacher characteristics were tested both at the individual level, using the Caregiver Interaction Scale, and at the classroom level,

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[5] The Caregiver Interaction Scale also measures teaching style; it is used to rate a single teacher, in contrast to the ECERS, which is used to rate an entire classroom. The 26-item scale rates teachers' sensitivity (degree of warmth, attentiveness and engagement); style (degree of harshness, and level of punitive and critical interactions); and detachment (level of interaction with, interest in, and supervision of children). A score of 1 indicates that a given behavior is "never true," whereas a score of 4 indicates that the behavior is "often observed." Higher scores for sensitivity and lower scores for harshness and detachment are therefore considered desirable.

using the ECERS or ITERS as appropriate. Researchers employed multiple regressions to test relationships, varying the orders and combinations in which formal education, specialized training and experience were entered into the equations. Teaching staff were categorized into five levels of training and education: 1) a BA and college-level ECE coursework; 2) a BA with no specialized ECE training; 3) no BA but college-level ECE; 4) no BA but specialized ECE training at the high school or vocational school level, and 5) no BA and no specialized training. Similar to previous studies, researchers found that more formal education was "better," in that it was the strongest predictor of both appropriate caregiving at the classroom level (along with ratios and wages), accounting for 13 percent of the variance, and individual teacher sensitivity, with a modest effect size of .07. Teachers with some college-level early childhood training or a bachelor's degree in the field engaged in more appropriate caregiving, and were more sensitive and less detached, than teachers with training at the vocational school level or lower.

Children in programs with more sensitive teachers and more responsive caregiving received higher language scores, spent less time in aimless wandering, and exhibited a higher level of peer play. Looking more closely at those teaching staff with college degrees and varying levels of early childhood training, the study found that teachers with a bachelor's degree (with or without specialized training at the college level) were more sensitive, less harsh and less detached than teachers with no BA and either no training or only training at the vocational school level or lower. With respect to appropriate caregiving, findings varied by age of child.[6] Preschool teachers were more appropriate when they either had a BA degree (with or without specialized training) or had no BA but college-level specialized training. The number of years of experience was not a good indicator of teacher behavior.

While establishing the important role of the bachelor's degree, the NCCSS does not provide clear information about teachers who have only an AA degree, with or without specialized training, and thus does not shed light on what is gained by earning a BA vs. an AA degree. The NCCSS points to the tangled relationship between formal education and specialized training, with formal education a stronger predictor but specialized training also important – a relationship difficult to tease apart because, in this sample and many others (Howes, 1995; Whitebook & Sakai, in press), most BA-level teachers also had completed ECE coursework at the college level. The NCCSS also points to the differential impact of levels and types of training and education for different populations of staff, suggesting the need for further research on positive training pathways for teaching staff with different learning styles, and different levels of education, motivation for working in child care and types of professional development experience.

Conducted several years later, the Cost, Quality and Child Outcomes Study (CQCO) replicated many of the NCCSS findings on the mediocre quality of center-based care in the United States, the impact of teacher wages, and the important role of teacher education and specialized training, and it extended our understanding of child care center finances and the differential impact of high-quality programs on children from low-income families. The CQCO study examined the quality of care in 400 child care centers, drawn from a stratified random sample of full-day centers in four states that represented the range of program auspices in each community. The study included 370 preschool classrooms and 122 infant/toddler classrooms. Observers used the ECERS or ITERS, the Caregiver Interaction Scale, the Woodcock-Johnson (1990) reading and math subscale

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[6] Teachers of infants and toddlers were more appropriate with children when they had either a BA and college-level training or no BA but specialized training at the college level.

(to assess pre-academic skills), and the Classroom Behavior Inventory (Schafer et al., 1978) to look at social development.

The CQCO study examined the correlations between different process and structural measures of child care quality. It also employed hierarchical regressions to examine the relative association between selected child care characteristics and child care quality, and the extent to which individual predictors were associated with child care quality when controlling for other variables in the regression model. Specifically, researchers examined the background of the lead teachers to ascertain the role that teacher education and training played in program quality and teacher behavior. Because teacher education and training were so highly correlated, lead teachers were categorized according to whether they had a BA degree, some college, or a high school diploma (Helburn, 1995; Howes, 1995). If there was more than one lead teacher per class, mean scores were averaged.

Like the NCCSS, the CQCO study looked at the role of teacher education in predicting both classroom interactions, as measured by the ECERS, and individual teacher behavior, as measured by the Caregiver Interaction Scale. In preschool classrooms, higher ECERS scores were associated with the lead teacher having a BA degree or, to a lesser extent, at least some college. But education alone did not explain quality: process quality was higher in classrooms where teachers had completed more education, had a moderate amount of experience, and earned higher wages.[7] For teacher sensitivity, the significant teacher background variables included whether the lead teacher had a BA degree, some college or experience, with lower sensitivity found among teachers with extensive experience. Higher levels of teacher responsiveness were related to adult-child ratios but not to individual teacher characteristics.

Because of the high levels of correlation among teacher formal education and specialized training, additional analyses were conducted to clarify the relative contributions of training and education (Howes, 1997). Eighty-one percent of lead teachers in the CQCO study could be categorized into four of the five groups into which formal education and specialized training were combined: 1) high school plus a few workshops in ECE; 2) a CDA certificate; 3) some college courses in ECE; 4) a two-year degree in ECE; or 5) a BA or more advanced degree in ECE. Since only a few teachers in the sample had received a CDA, this group was dropped from the analyses. Teachers with the most advanced education were the most effective overall. Teachers with a BA or more advanced degree in ECE were rated as more sensitive than teachers with AA degrees in ECE, who in turn were rated as more sensitive than teachers with other backgrounds. Teachers with at least an AA degree were less harsh than teachers with other backgrounds. Teachers with AA degrees were more effective than teachers with some college or just high school plus workshops. Teachers with at least an AA degree in ECE were observed to be more responsive than teachers with other backgrounds, and teachers were more responsive in classrooms that were in compliance with regulations governing adult-child ratios. Children in classrooms with teachers who had at least an AA degree in ECE had higher scores on the Peabody Picture Vocabulary Test (Dunn, 1984) than did children in classrooms with teachers having only high school backgrounds.

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[7] Experience was nonlinearly related to quality, with higher ECERS scores if the teacher had less than 37 months of experience, and lower ECERS scores otherwise. Although most studies consistently find a negative relationship between years of experience and teacher behavior, and/or no contribution of years on the job to classroom practice, it is unclear whether ongoing professional development or continuing education requirements might alter these effects.

In order to address the complex interrelationship of formal education and specialized early childhood training, Howes also analyzed data from the Florida Quality Improvement Study, using the same categories of blended education and training as described above for the CQCO study. Ninety-two percent of the teachers from the Florida sample fit into the predetermined categories. Since very few teachers in this sample had AA degrees in early childhood education, this category was dropped, but the CDA was included. The Florida study involved 150 centers from four counties; the sample was stratified according to percentage of subsidized children in the centers, with those serving more than 50 percent children on subsidies defined as "low-income" centers, and those serving less than 50 percent defined as "high-income" centers.

For the analysis of predetermined teacher background categories, Howes included 410 of the 466 classrooms in the Florida study serving infants, toddlers or preschoolers because of an exact teacher match. The same procedures were employed in the Florida Study as in the CQCO, except that additional teacher behavior categories were added to the observation in the Adult Involvement Scale. Among her findings:

- Teachers with at least a BA degree in ECE were rated as more sensitive than all other teachers.
- Children whose teachers had at least a BA degree in ECE were observed to have higher percentages of responsive involvement scores than children with all other teachers.
- Children with teachers with CDA training received a higher frequency of positive initiation than children in other classrooms.
- Children whose teachers had a least a BA in ECE, or CDA training, had higher frequencies of language play and positive management than children whose teachers had a high school education only.
- Children whose teachers had at least a BA in ECE engaged in more creative activities than children in all other classrooms.

Howes concludes that "coherent teacher preparation programs at various levels of cost and time investment are more successful in terms of effective teaching and children's experiences than is having teachers simply take college courses or informal workshops. Although teachers with the most advanced education and training appear to be the most effective, teachers with associate of arts degrees and CDA certificates were more effective than teachers with some college or just high school plus workshops." The Florida study suggests that while the BA in early childhood education is the most effective in terms of program quality and child outcomes, other blends of training and formal education can produce effective teacher behavior as well.

In his review of the CQCO study, and by extension others like the NCCSS, Blau (2000) questioned whether unobserved characteristics of centers might be confounded with the effects of structural inputs, such as teacher education, and re-examined the CQCO data using two different methods to control for spurious correlations. One method controls for center-specific characteristics, and the other uses zip codes to control for location fixed effects. One such analysis[8] found effects for teacher education and training, but the effects were generally less robust when zip code and center fixed effects were included. Some measures of education and training, however, were still statistically significant, even when the fixed effects were included, but they were somewhat

[8] Blau, an economist, points out that these analyses represented a new approach in early care and education research and needed to be replicated in other studies.

contradictory. When controlling for center and zip code effects, workshop training and lower levels of formal education had greater impact. Other analyses showed, however, that workshop-based training and a college degree in ECE provide the most productive type of teacher preparation. Blau's reexamination of the data underscored the persistent effect of the BA degree, while suggesting that the precise form of specialized training for staff in different positions may be more complex.

In a study of child care quality in Massachusetts, Georgia and Virginia – three states with wide variation in child care regulations – Scarr and her colleagues (1994) examined the correlations among process quality as measured by the ECERS and ITERS (Harms & Clifford, 1980) and the Assessment Profile for Early Childhood Programs (Abbott-Shim & Sibley, 1987), and structural measures of child care including staff education and training. An infant, toddler and preschool classroom was observed in each of the 40 centers in the three states. Staff background was captured through interviews and categorized into one of five groups: 1) no specialized training; 2) workshops or in-service training; 3) a CDA certificate; 4) vocational school or high school training; and 5) college- or graduate-level early childhood education courses. Education was captured in nine categories, ranging from none to an Ed.D. or Ph.D. Although teacher education and teacher training, along with adult-child ratios, showed modest correlations with the process quality measures, teacher wage was the regulatable variable most highly correlated with process quality, and Scarr et al. suggest wages to be a better and more useful, although complex and indirect, indicator of center quality than were other teacher characteristics. The researchers raised concerns, however, that the wide range of quality among classrooms in the sample may have impacted the results. In a later analysis of this data set (Phillips et al., 2000), teacher education and training contributed jointly an additional 14 percent of the variance in classroom processes over and above the effects of regulatory stringency and ratio compliance, but for preschool classrooms, only wages and ratios predicted classroom quality. Recognizing that wages are a proxy for recruiting and retaining highly qualified staff, these findings suggest more exploration of how higher wages relate to the teacher background climate – the percentage of staff with various educational and training backgrounds within centers and classrooms – and how the composition of the staff as a whole impacts teacher behavior and program quality.

Then and Now: Changes in Child Care Staffing, 1994-2000 (Whitebook, Sakai, Gerber & Howes, 2001; Whitebook & Sakai, in press) sheds somewhat more light on how wages influence center quality, in part because the study examined the percentage of staff with different backgrounds who stay at and leave centers over time, their wages, and the impact of these on quality. The sample included 92 centers from three California communities studied over a period of six years. Preschool classrooms (one or two depending on center size) were visited three times, in 1994, 1996 and 2000. The authors addressed the limitations of the sample, and cautioned readers to view the findings as the best-case scenario for child care quality, since many programs in the sample had sought and/or achieved NAEYC accreditation, and teaching staff were highly educated, with 45 percent having completed at least a BA degree, and 58 percent having completed a supervised practicum (Saluja & Clifford, 2002). Nevertheless, as one of the few longitudinal examinations of center quality and staffing ever conducted, the study merits some consideration.

Classroom observations using the ECERS and Caregiver Interaction Scale were conducted in the same classrooms at each visit, and interviews were conducted with teachers to collect information about background and attitudes. Center directors also completed a staff census at each visit, providing information about the education, training, tenure and wages of all teaching staff in the center. Teachers were categorized in two groups: those who had completed some college and

some specialized training at the college level, and those with a BA or higher degree and specialized early childhood education or child development training. The BA degree again played a prominent role in predicting center quality, along with other variables including nonprofit status, higher wages paid to teaching staff, and NAEYC accreditation. Notably, it was not merely the presence of BA-level teachers that accounted for higher quality, but the "turnover climate" of the center, defined here as the percentage of teachers with at least a BA degree and specialized early childhood training who were retained at the centers between observations.

Results of a discriminant analysis indicated that for all teachers in the centers, highly trained teachers (BA-level or higher, with specialized training) were more likely to leave their jobs if they earned lower wages, worked with fewer highly trained teachers, and worked in a climate with less stability. These three predictors accounted for 64 percent of the variance of group membership (highly trained who leave, highly trained who stay, less trained who leave, less trained who stay). For observed teachers for whom they had more personal information, the authors found that in addition to the predictor variables mentioned above, membership in a professional organization also discriminated who left and who stayed. Highly trained observed teachers were more likely to leave the center if they earned lower wages, worked with fewer teachers with a four-year degree or higher, worked in centers with high turnover, and did not belong to a professional organization. These variables accounted for 64 percent of the variance in group membership. Highly trained teaching staff who stayed earned $3.00 more per hour than highly trained teaching staff who left.

In addressing the question of which centers were able to sustain high quality over time, the study identified the presence of a greater proportion of teachers with BA degrees or more as the strongest predictor of whether a center maintained a high level of quality. This study suggests that teachers do not function in isolation, and teacher characteristics must be understood in the context of the educational composition and stability of the staff as a whole.

The research reviewed thus far focuses on community-based early care and education programs, only some of which include a more formal preschool component organized similarly to publicly funded preschools. Next, we turn to research on teacher qualifications in programs similar in mission to public preschools operated or being developed by states and local communities.

The Head Start FACES (Families and Child Experiences Survey) study (Zill et al., 2001) was designed to answer questions about the critical elements that lead to program quality and positive outcomes for children in Head Start, and was based on a national random sample of programs, stratified according to region of the country, urbanicity, and percentage of minority families using the programs. Classroom quality data were drawn from 40 programs (180 centers, 518 classrooms and 3,200 children) that participated in FACES from fall 1997 to spring 1998. Staff and families were interviewed and children were assessed at entry into the program, in the spring, and at completion of one or two years of Head Start, and again in the spring of their kindergarten and first grade years. Teachers provided information about their years of teaching experience, the highest level of education they had achieved, the number of courses in early childhood education they had completed, credentials obtained, and membership in professional organizations. One-day classroom assessments included the ECERS, the Caregiver Interaction Scale, and the Assessment Profile Scheduling Scale and Learning Environment Scale (Abbott-Shimm & Sibley, 1987).

Approximately one-third of the teachers had completed a BA degree or higher, and an additional one-third had some college-level experience. The quality of Head Start classrooms in this

sample was higher than found in most studies of child care (Helburn, 1995; Whitebook et al., 1990). Classrooms with higher levels of quality had teachers with higher levels of education, greater experience, and more positive attitudes and knowledge about early childhood education. Higher levels of teacher education, which in this study were four-year degrees or higher, appeared to influence teacher attitudes and knowledge, which translated into higher levels of classroom quality. Teachers rated higher in sensitivity had higher education levels as well. Preliminary results found that children in classrooms led by teachers with more education scored slightly higher on vocabulary knowledge and story and print concepts, but these relationships were modest. Further analyses of these data are expected to clarify the role of training, education and provider beliefs about practice, and to control for socioeconomic characteristics and other program-level factors, but these initial results underscore the role of the four-year degree in enhancing program quality.

In New Jersey, as part of an ongoing effort to assess the quality of early care and education that children receive in the state's lowest-income school districts, researchers assessed the quality of 120 community-based preschool programs for three- and four-year-olds (Barnett, Tarr & Frede, 1999; Barnett, Tarr, Lamy & Frede, 2001). Staff completed the Classroom Activities Questionnaire (CAQ), which measures appropriate practices in the classroom, and classrooms were observed using the Classroom Practices Inventory, a measure found to predict whether preschool programs contribute to long-term educational gains for disadvantaged children. Classrooms were also assessed using the ECERS-R. Teachers were categorized according to whether or not they had a BA, and if so, whether the degree was in ECE or in another field. The highest-quality programs were those operated by school districts, which require teachers to have BA degrees and therefore employ a considerably higher percentage of BA-level teachers. The researchers were unable to analyze differences between those with a specialized BA in ECE and those who had majored in another field, in part because many teachers majored in elementary education with a concentration in early childhood education.

Implications and Future Research

As states and communities work toward developing high-quality preschool programs for three and four year olds, they face several intertwined issues related to staffing these programs. The first involves deciding on optimal teacher qualifications. A second set of questions involves what we know about creating effective teachers, including alternative pathways to the four-year degree. A final set of questions involves the feasibility of achieving the new standards, including the capacity of the higher education system to meet a growing demand for teachers with four-year degrees, and whether there will be adequate compensation to recruit and retain such an educated workforce.

Teachers of young children are increasingly called upon to have more sophisticated knowledge of children's capacity to learn and of strategies to help them do so. Writing on behalf of the Research Council of the National Academies of Science, Bowman and colleagues argue in *Eager to Learn* (2001) that there exists a serious "mismatch" between the preparation (and compensation) of early childhood teachers and the expectations for their jobs: i.e., helping children to optimize their developmental potential and to set the stage for success in the school years and beyond. If teachers are required to have bachelor's degrees and specialized training and credentials once children reach kindergarten, are there compelling reasons why similar qualifications, based on appropriate content for the preschool child, should not be required for those who teach children a year or two younger? A first step in addressing this issue is to consider what we know from empirical evidence.

The studies reviewed here encompass most of the major, large-scale investigations of child care settings conducted in recent years, as well as the most recent research on quality in public preschools and Head Start. While there are some limitations to this group of studies with respect to sample, measures and analytic methods (Barnett, 2003a; Glantz & Layzer, 2000; Lamb, 1998), they underscore, on balance, the importance of more higher education and specialized training, and identify the particular role of the bachelor's degree, most often in early childhood education, in producing teacher behaviors consistent with high-quality programming, which in turn supports better developmental outcomes for children.

Teacher behavior is one of the major influences on child development (Shonkoff & Phillips, 2000), and understanding how to ensure that young children encounter teachers who are sensitive, appropriate and able to create responsive learning environments is one of the central questions facing those who develop and implement early care and education programs – publicly supported preschools in particular. The evidence to date suggests that optimal teacher behavior in center-based settings, and the skill and knowledge upon which it rests, are best achieved through a four-year college degree, which includes, in most instances, some specialized content in early childhood education or child development. Still, this body of research raises many questions that require further investigation, particularly with regard to: thresholds of education and training; the content, format and quality of specialized early childhood training; variations in strategies for teachers with varying characteristics and needs; and the aspects of the adult work environment that scaffold teachers' knowledge, enabling them to engage in effective strategies with children.

But while the research points to the importance of the bachelor's degree, and the vast majority of studies find that more education and training is better than less, we do not yet understand precisely what we gain from the BA over the AA degree, for example, or what value is added with an advanced degree. Additionally, there is emerging evidence that alternative pathways to effective teaching exist, and may be important for increasing and diversifying the corps of skilled instructors of young children. Howes, James & Ritchie (2003) report that within a group of primarily African American and Latino teachers with less than four-year degrees, working in high-quality programs serving children of low-income families, teacher responsivity was predicted, after controlling for formal education, by such factors as staying in the field for the sake of benefiting one's community, being mentored early in their careers, and receiving ongoing supervision.

Clarifying what is meant by specialized training in early childhood education and child development, and under what circumstances it advances teacher behavior, is of the utmost importance. For many in the current early care and education workforce, specialized early childhood training and higher levels of formal education have gone hand in hand, making it challenging to identify the differing contributions that formal education and less formal training make to teacher behavior. There continues to be not only confusion in the literature, but also among practitioners and policy makers, about the particular role of training in early childhood education or child development, with large investments into a wide array of training programs targeted at a diverse group of teachers and providers (Brown, Burr, Johnson, Krieger & Mihaly, 2001).

Researchers have found it difficult to collect reliable, consistent information about training that helps to clarify how the amount, intensity, content and quality of instruction impact its effectiveness. In part, this is because teachers and providers themselves are often unable to detail their educational and training histories sufficiently; many have engaged in a wide array of professional development activities for years or even decades. Some studies look at the number of

courses a teacher has taken over the course of a career, while others look at training completed in the last year. The formal education level of training may or may not be specified in the research designs, and few studies focus on the actual content of training (Arnett, 1989). The issues of supervised teaching or mentoring as training strategies are seldom compared to other more academic approaches to learning (Snider & Fu, 1990; Whitebook & Sakai, 1995), but there are suggestions from the literature that an integrated program of training – such as the CDA, or degree programs with a supervised teaching component and/or mentoring – contribute more to effective and enduring teacher practices (Howes, 1997). This hypothesis needs more direct testing.

For teachers in grades K-12, in-service training must be continuous, intensive and individualized in order to be effective (Bowman et al., 2001). Little is known about the impact of training at different points in the career of a teacher, which types of behavior are sensitive to which types of training, the effectiveness of training related to educational background, and the extent to which exposure to new ideas actually influences teacher behavior in the classroom (Cassidy, Buell, Pugh-Hoese & Russell, 1995; Kaplan & Conn, 1984; Snider & Fu, 1990). Bowman and colleagues (2001) point to the literature in K-12 education, which suggests that teachers adapt their practice to new ideas only when their prior conceptions and memories of early experiences as learners are challenged.

While researchers have moved somewhat beyond the category of child-related training employed in the early child care studies (Ruopp et al., 1979; Berk, 1984; Dunn, 1993), the research, on balance, still uses an "any size fits all" approach to specialized training, making it impossible to delineate the characteristics of effective instruction for adult learners from a wide range of backgrounds. We have yet to understand the different blends of training and formal education that lead to responsive and effective teaching.

We also need further clarification regarding the context of the adult work environment in which teachers operate with other teachers and professionals. There is some evidence of how adult-child ratios, group size, and compensation affect teachers' behavior in the classroom and their decisions whether or not to remain on the job. But because early childhood classrooms are staffed by more than one adult, and classrooms within a program operate in concert to various degrees, more exploration is needed of how the background of other teachers impacts teacher behavior and program quality, particularly as policy makers grapple with staffing patterns for preschool classrooms.

The *Then and Now* study suggests that quality is mediated by the background climate of the classroom and center, and that individual teachers are responsive to the training levels of their colleagues, but this finding needs to be replicated in larger, more diverse samples. Highly-educated and well-trained teachers may not be able to apply their skills and knowledge, and behave sensitively and appropriately, in a poor-quality program, or when their co-workers do not have adequate professional preparation (Whitebook & Sakai, 1994). Such a situation may even drive them from their jobs or from the field altogether (Whitebook & Sakai, in press).

In addition to understanding more about the adult environment in which teachers operate, we also need to understand how individual characteristics beyond education, training and experience

influence teacher behavior.[9] The early care and education workforce is exceedingly diverse, not only in terms of education, training and experience, but also with respect to literacy skills, English proficiency, the ability to communicate in other languages, economic background, current family status, and a range of personal characteristics – including levels of social support, as well as depression, which may impact their access to education and ability to learn as adults (Phillips, Crowell, Whitebook & Jo, 2003; Whitebook & Sakai, 2003).

Decisions about qualifications and requirements for preschool and other early childhood teachers will be driven not only by empirical evidence, but also by their feasibility. Thus far, most states have chosen to weave universal preschool into their existing mixed delivery system of early care and education, for several important reasons: the need for a large number of facilities, which any single sector (including the public schools) is unlikely to be able to provide on its own; the desire to build on the strengths and quality that the system has already achieved; the desire to promote parent choice and meet working families' needs, and to serve as many children as possible; and an interest in serving children where they are, since many of those eligible for preschool will already be in an early care and education setting of some kind.

A primary question is to what extent the existing early care and education workforce (or a segment of it) will participate in any newly configured system, and to what extent it will be necessary to recruit a largely new cohort of practitioners. The members of the current workforce are highly diverse in terms of educational background, ability, and commitment to the profession, but no universal preschool system is taking shape (or is likely to) without involving many of them. This is not to say that all members of the current workforce will be appropriate for the job, or that additional personnel will not also be needed, but it does suggest that if standards are raised, many who already work with young children will seek to upgrade their education and training in order to meet the new requirements. The more diverse a preschool system a state creates, therefore, the more complex it could be to get segments of the current workforce up to a new set of common standards for professional development.

Standards will also have a major impact on training and higher education systems for early childhood education, which, much like the early care and education system, are themselves diverse and uncoordinated. Once a state has set its qualifications for publicly supported preschool staff, what will the higher education system need in order to be ready for the job, in terms of additional instructors, revamping of curricula, and scholarships and other forms of financial support for potential students? The primary shortcomings of the higher education system in most states revolve around issues of articulation, content and institutional capacity (Bellm & Whitebook, 2003; Governor's Task Force on Universal Preschool, 2002; Lekies & Cochran, 2002) and the investment and coordination the system will need in order to meet a growing demand. A limited amount of scholarship assistance and other financial aid is available through Pell Grants and other means, but early care and education students are often uninformed about or excluded from access to them. In some states, four-year institutions, in contrast to two-year colleges, do not generally see early childhood education as part of their purview – leading to the twin problems that most education

[9] It is important to note that the composition of the early care and education workforce changes over time, with some notable shifts in the percentage of the workforce with college degrees as well as other demographic characteristics (Burton, Laverty & Duff, 2002). How these changes influence the staffing patterns in programs, and the attendant issues of training and educational needs, are questions that have largely gone unexplored.

departments in four-year colleges and universities are poorly integrated into the overall professional development system for early care and education, and are poorly articulated with two-year programs of study (Bellm & Whitebook, 2003).

Perhaps the greatest barrier centers on whether higher standards will be tied to appropriately higher compensation levels. While standards and compensation are often discussed as separate topics, they are really interdependent, and publicly supported preschool offers an opportunity to confront both challenges hand in hand, so that professional development is directly tied to a coherent wage and career ladder, and an equitable compensation package is incorporated into a state's "price tag" of what a universal preschool system will truly cost.

When standards are not linked to an appropriate system of financial reward, the danger is that the compensation, qualifications and retention of preschool staff will vary widely based on where programs are delivered, thus failing to address the fundamental need for a skilled, stable, high-quality workforce throughout the preschool system. A recent study of state-funded prekindergartens by the Center for the Child Care Workforce found disturbing evidence of a two-tier system emerging in several states, in which personnel at publicly operated Pre-K sites had significantly higher educational qualifications, higher compensation levels and lower turnover than those at privately-operated sites. In California, for example, where 30 percent of State Preschool staff in public school settings had earned a BA, only eight percent of their counterparts in privately operated State Preschools had done so. Further, average starting salaries for State Preschool teachers were $14.16 and $10.84 per hour in publicly-operated and privately-operated settings respectively. Across states, this trend appeared to be due primarily to public schools' larger infrastructure and greater access to resources (Bellm et al., 2002). If preschool services are to be delivered partly through the private system, and if teachers are required to achieve four-year degrees, it will be essential to establish resources and mechanisms to avoid such a disparity, and to integrate compensation standards for preschool into overall program design.

Conclusion

Throughout the United States, many children are failing to reach their full potential in school. But driven in part by what we have learned about early childhood development, the academic, business (The Business Roundtable, 2003) and policy communities now recognize that high-quality preschool programs are an important way to rectify this situation. And based on what the research has shown thus far, it appears that teacher preparation at the four-year college degree level is the best way to achieve such quality. We do need, however, to learn more about effective alternative pathways to teacher preparation, particularly to ensure linguistic and cultural diversity in preschool programs.

If we do indeed agree that early learning environments are critically important to children's later success, then our goal must be to ensure that preschool programs can live up to the expectations placed on them. This is largely a question of resources and public will. We can set preschool teacher standards at the BA level, but unless we put together the resources to make educational opportunities available to current and prospective teachers, clarify what are the optimal characteristics of preschool teacher training, and compensate teachers sufficiently to retain them in the field, the question of higher standards will remain an academic one, and preschool could continue to be a stepchild of our educational system.

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